Achieving Integrated Water Resources Management

- Water Quality Standards Compliance
- Maximize Stormwater Capture
- Maximize Flood Control
- Provide additional open space and habitat benefits
- Maximize Water Recycling
- Maximize Water Conservation
- Sustainable Funding for programs and O+M

Example - City of Los Angeles – One Water Plan

State Water Bond Measures
General obligation bonds (State pays them back through general fund).

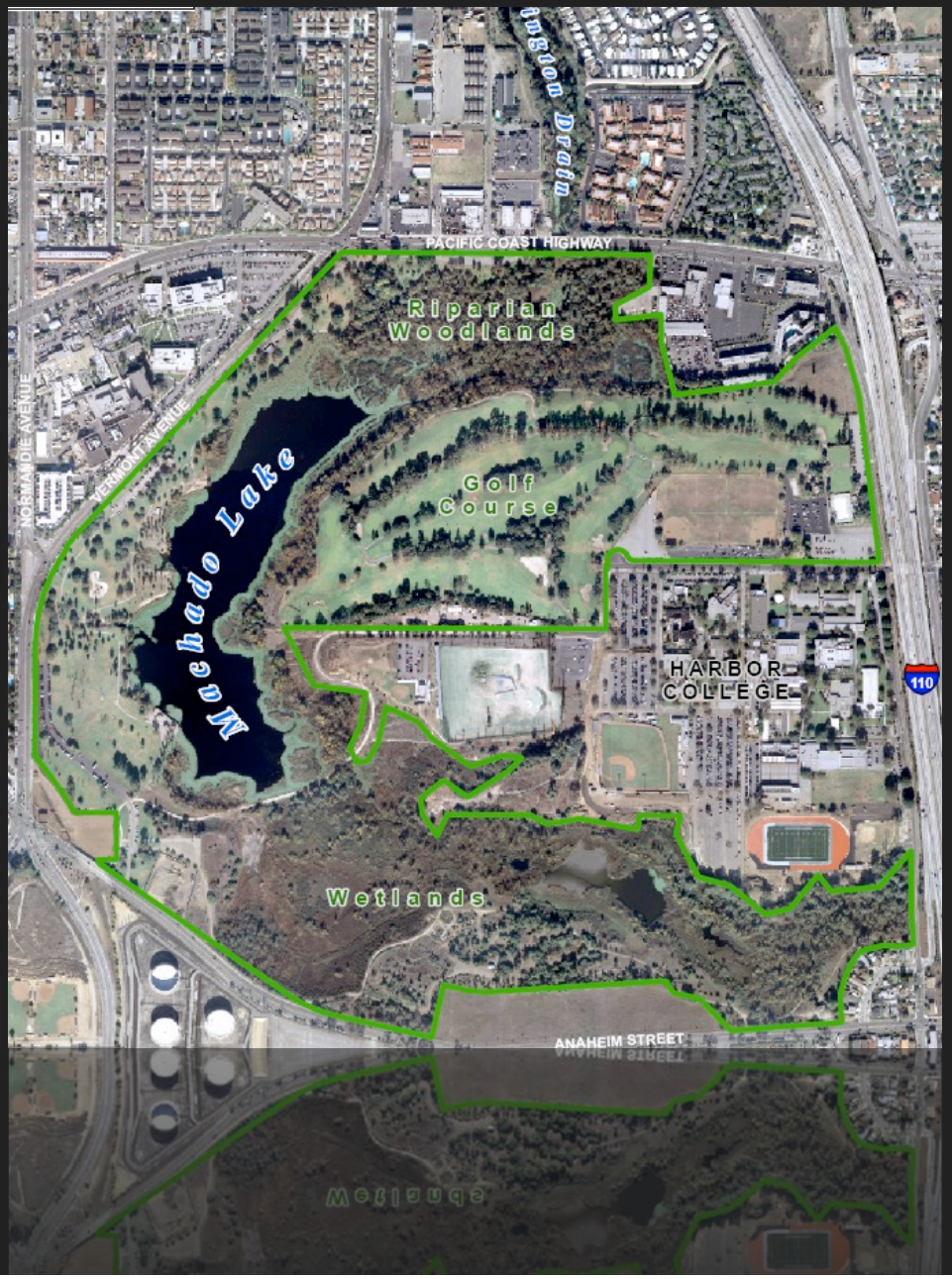
- Propositions 13, 40, 50, 84 and 1
- Prop 13 – 2000 - 65% approval - $2 Billion
- Prop 40 – March 2002 – 57% approval - $2.6 Billion
- Prop 50 – November 2002 – 55% approval - $3.4 Billion
- Prop 84 – 2006 – 54% approval - $5.4 Billion
- Prop 1 –– 67% approval - $7.5 Billion
- Prop 68 – June, 2018 proposition – another $1.6B for water. TBD.
- **Can only pay for capital costs. Not for Operations and maintenance or programs.**
- **2020 – Climate Resilience Funds – September 2021**

Proposition O

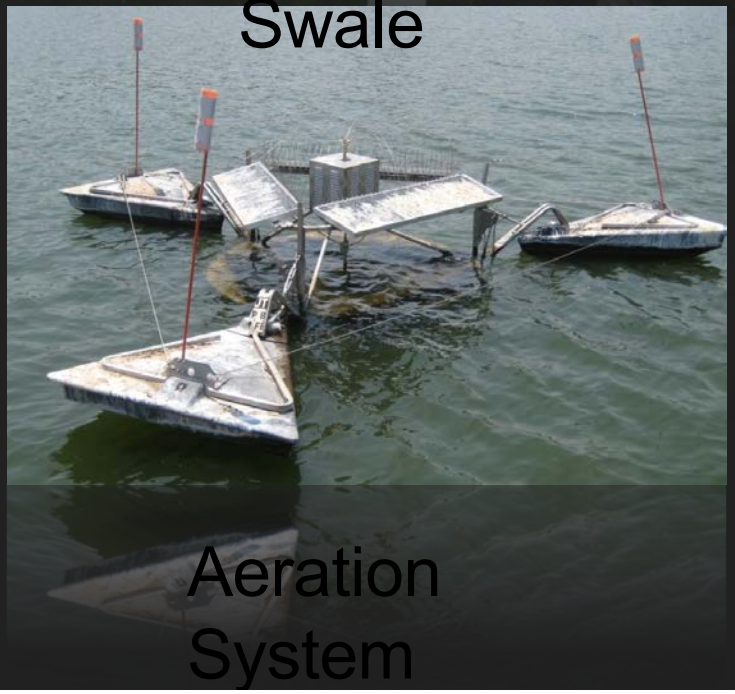
- $500 million bond measure for Los Angeles
- Passed with over 76% of the vote in 2004
- Primary focus – To enable L.A. to comply with the County stormwater permit and local TMDLs by reducing runoff pollution
- Secondary – multi-use benefits including water supply, flood control, recreation and habitat
- Bond measures only pay for capital costs

Proposition O – Machado Lake

Machado Lake Ecosystem Rehabilitation



Vegetative Swale



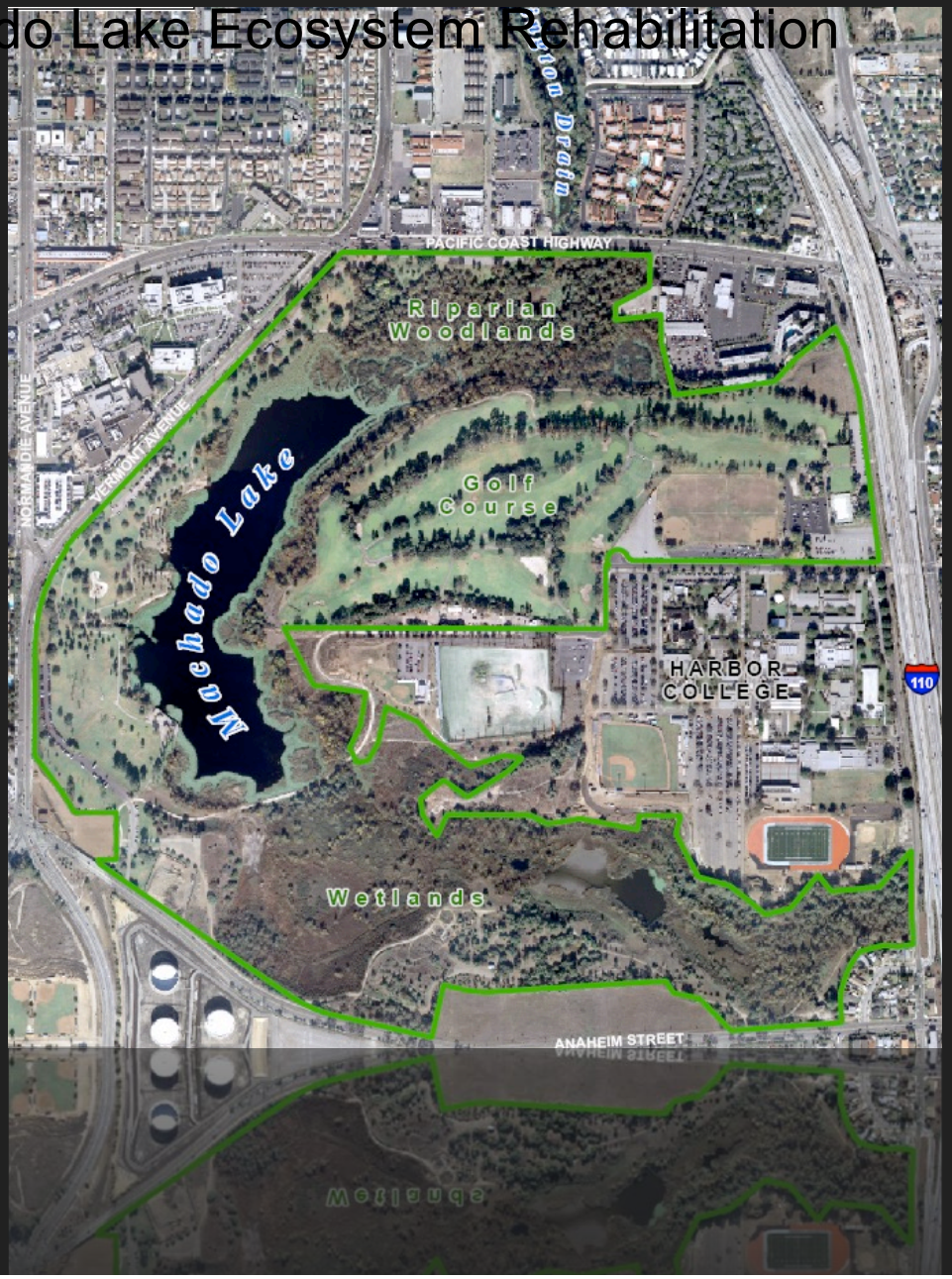
Aeration System

CITY OF LOS ANGELES
SANITATION
DEPARTMENT OF
PUBLIC WORKS

Green Streets and LID

Proposition O – Machado Lake - Nature Based Solution project

Machado Lake Ecosystem Rehabilitation



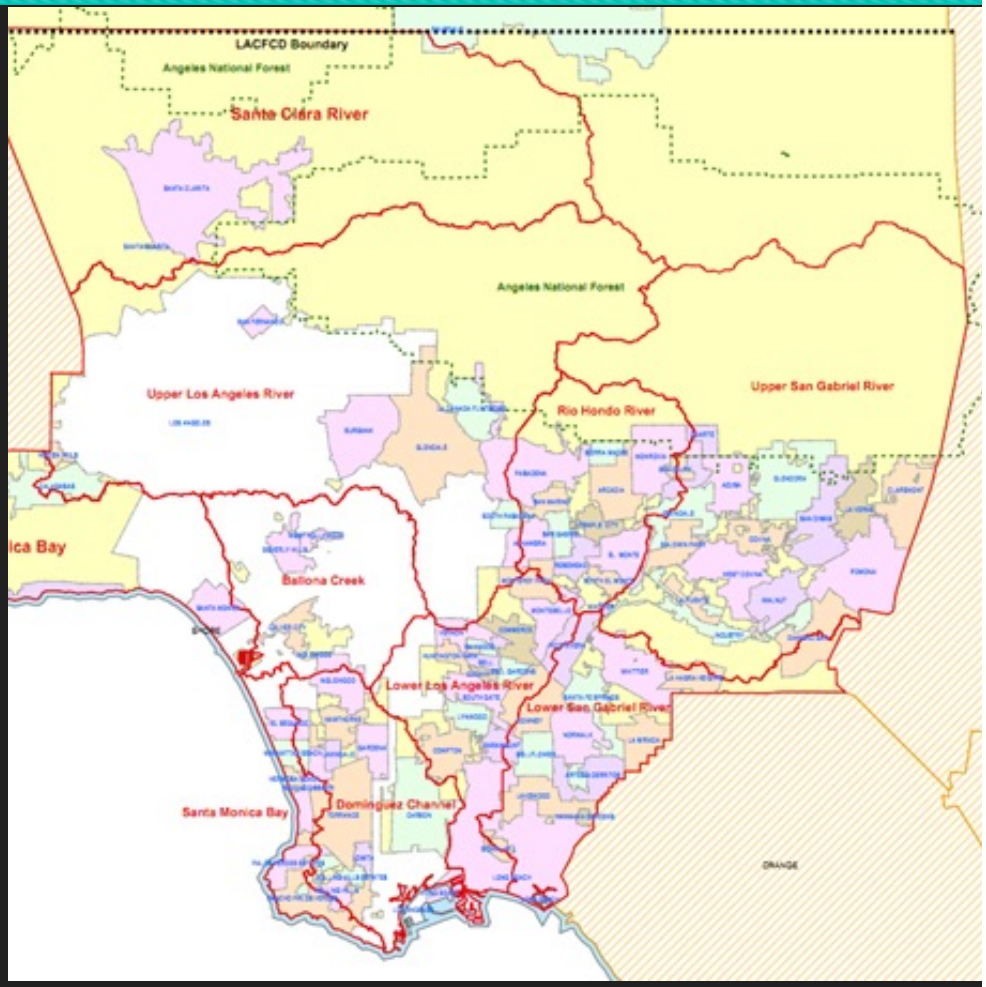
Vegetative Swale

Aeration System

CITY OF LOS ANGELES
SANITATION
DEPARTMENT OF
PUBLIC WORKS

Measure W

- Countywide measure - $83/household annually. $300 M/yr
- 9 watershed jurisdictions
- Approximately 40% for the cities, 50% for watershed groups. 10% for monitoring and administration.
- 218 challenges
- 2018 – LA County Measure W. Board of Supervisors voted 5-0 to pursue funding. Resiliency approach. **Passed with 69.5% of the vote!!!** Not just stormwater for water quality, but IWM. Safe, Clean Water Program. Goal of $300M a year in perpetuity. Parcel tax.

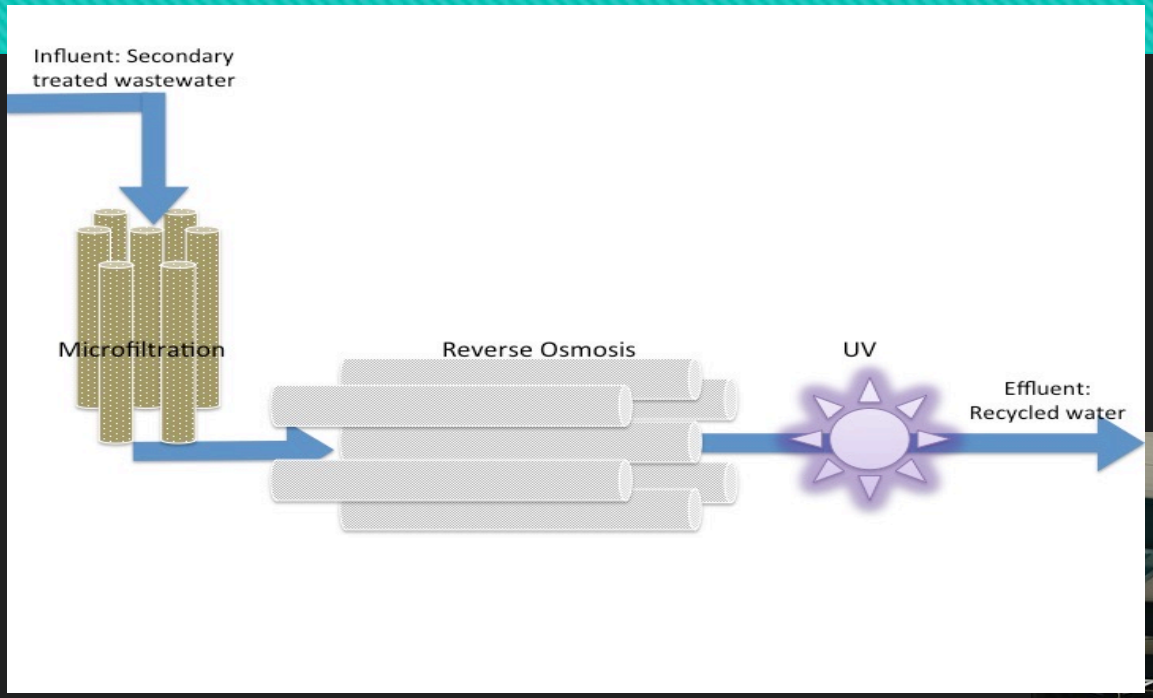


Water Recycling

- Tertiary Treatment (filtration and disinfection – Title 22 – bacteria 2.2 total coliforms cfu per 100 ml and turbidity not to exceed 10 NTU (nephlometric turbidity units))
- Advanced treatment – MF-RO, denitrification, UV-peroxide – NDMA removal
- Non-potable uses – irrigation and industry
- Indirect Potable Reuse – mixing – groundwater or reservoirs – purple pipe
- Direct Potable Reuse – no infrastructure

West Basin – Ed Little Water Recycling Plant

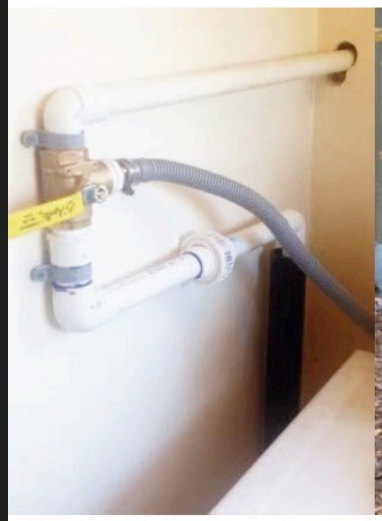
Advanced Treatment



Home Greywater Use

- Chapter 16A of the CA Plumbing Code
- Only from bathtubs, showers, clothes washers. No kitchen sinks or dishwashers.
- Sub-surface irrigation – outlet covered in 2" of material.
- No spray irrigation or use in ponds.
- No use on root crops or edible parts of food crops

Greywater



Greywater Systems

overview scope projects next

Water LA

capture · conserve · reuse

Desalination

The Carlsbad Desalination Plant Process
START
1) The Process Begins
The ocean flows into Agua Hedionda Lagoon
Agua Hedionda Lagoon
PACIFIC OCEAN
2) Pumping Seawater
600 million gallons is pumped into system.
4) Desalination Starts
By filtering seawater through osmotic membrane filters, over 99.8 of salt is removed and formed into a brine.
Desalination Plant
Screens keep sea life out of system.
6) Over 45 Million Gallons of Drinking Water Produced
Producing 7-10% of potable water for San Diego County businesses, schools and homes everyday.
100 Million Gallons
45 Million Gallons
500 Million Gallons
FINISH
5) The Brine Is Put Back Into the Ocean
By diluting brine to lower salinity of 36.2 ppt, we minimize harm to sea life (normal is 33.5 ppt)
Encina Power Plant
3) Water Helps Produce Power
Water used as coolant for Encina Power Station. A majority of the water is released back into the ocean.
How Does It Affect San Diego County?
By using PX pressure exchangers, this process will reduce CO2 emissions by 41,000 metric tons per year. That is equivalent to taking 8,542 cars off the roads.
When the Carlsbad Desalination Plant comes online in 2016, it will be the largest, most technologically advanced and energy efficient desalination process in the western hemisphere.
Sources:
CarlsbadDesal.com • PoseidonWater.com • CarlsbadDesal.com/EIR
UTSanDiego.com/News/2013/Mar/31/Poseidon-Carlsbad-Desalination-Water
SDCoastKeeper.org/Learn/San-Diegos-Water-Supply/Desalination.html
1% FOR THE PLANET
drips water
www.dripswater.com

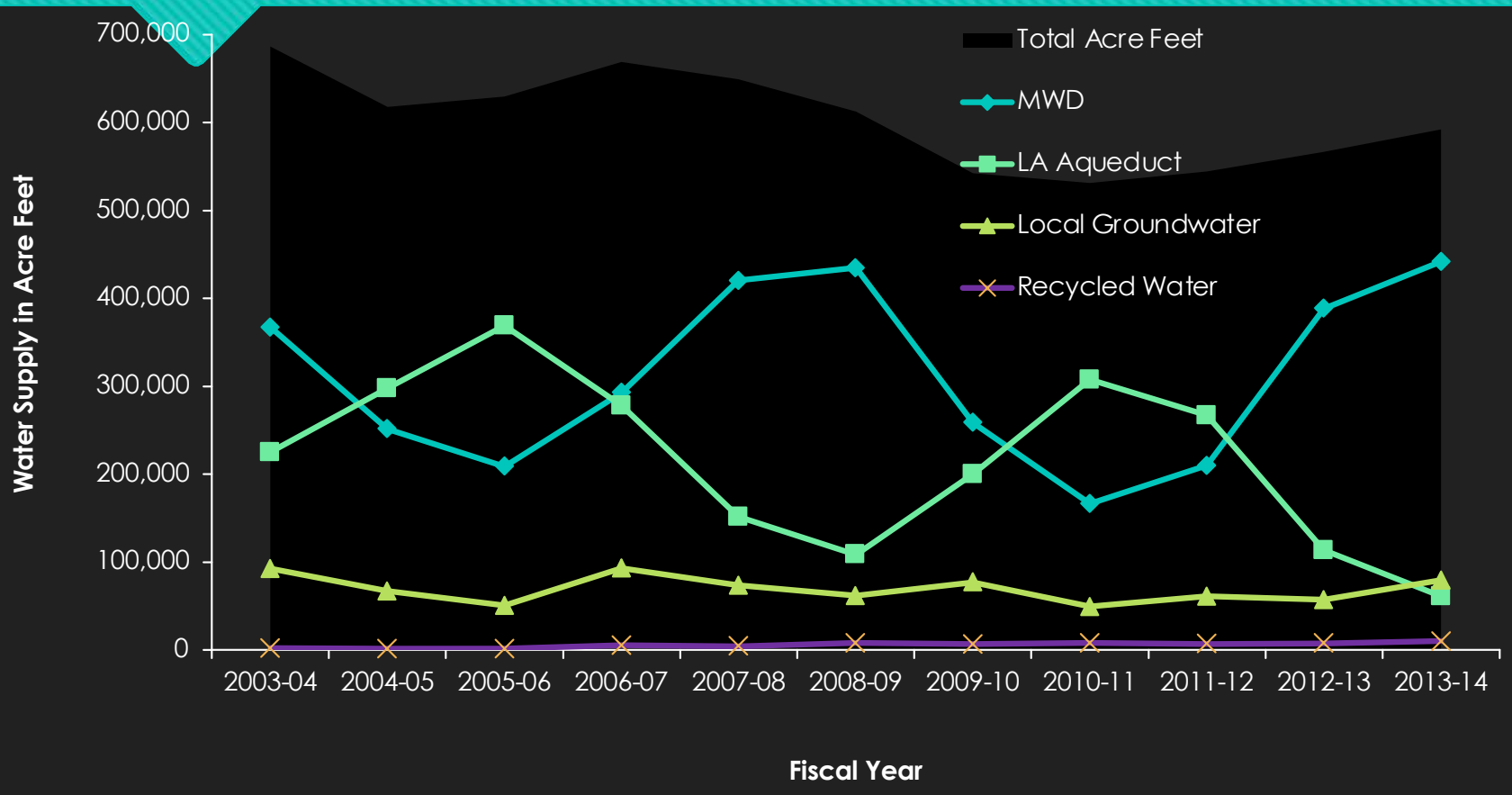
Water Conservation: Turf Replacement – A $500 Million+ Social Engineering Conservation Experiment in Southern California

UCLA Grand Challenge: Sustainable LA

GOAL: 100% renewable energy, 100% locally sourced water, & enhanced ecosystem health by 2050

Sources of Water for LA City

LADWP Water Supply Portfolio 2003 - 2014

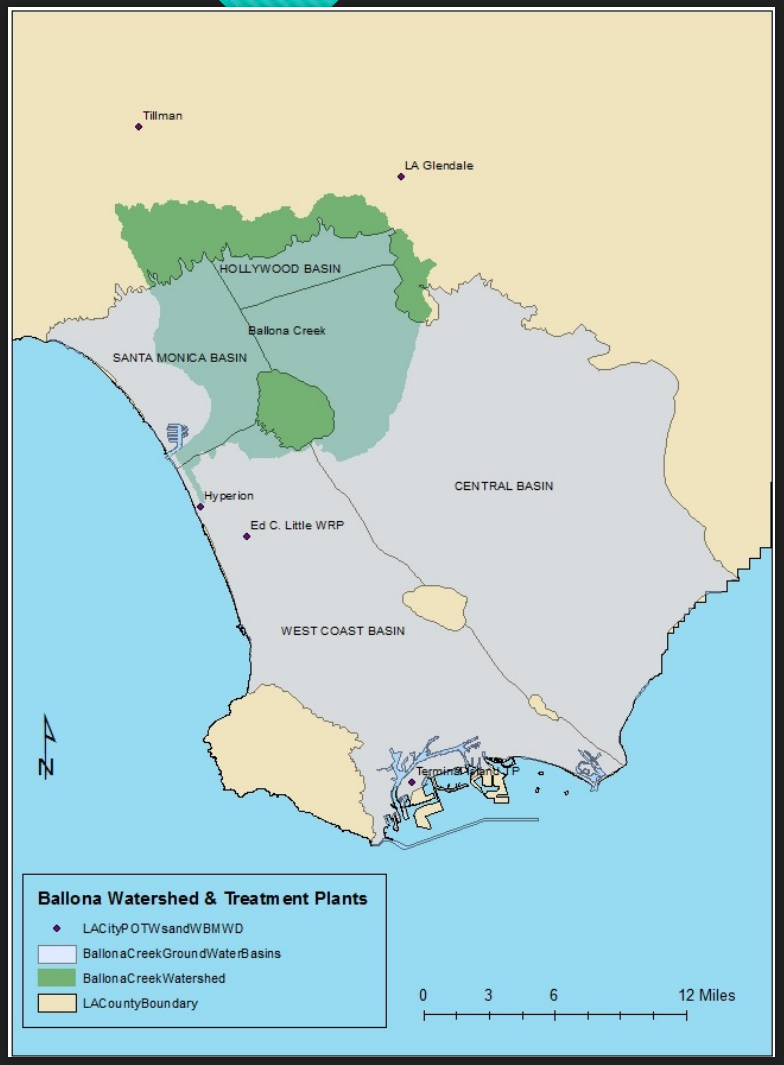


Data source: https://data.lacity.org/A-Livable-and-Sustainable-City/LADWP-Water-Supply-in-Acre-Feet/qyvz-diiw

L.A. Sustainable Water Supply Approach

- Summarize existing City of LA water plans – DWP integrated water plan, IRP, Water Quality Compliance Master Plan, County IRWMP, TMDL Compliance Plans, pertinent salt and nutrient management plans.
- Use of watershed stormwater flow/land use pollutant concentration models to determine appropriate suite of BMPs to attain receiving water quality standards.
- Start with Ballona Creek, then Dominguez Channel and finish with the Los Angeles River
- Estimate dry and wet weather volumes of stormwater infiltrated or captured with various alternatives

Ballona Creek and Dominguez Channel Watersheds – and adjacent groundwater basins



L.A. Sustainable Water Supply Approach

- Watershed approach to maximizing water recycling – Dominguez Channel and Terminal Island Treatment Plant. L.A. River and Tillman and Glendale. Ballona area and Hyperion.
- Use of groundwater maps to determine aquifer capacity, recharge potential and estimate maximum sustainable yield.
- Determine flood control, open space/recreation and habitat benefits of various alternatives
- Cost/benefit alternatives of various alternatives

City of Los Angeles Water Use Scenarios (Is Self Sufficiency Possible?

- Assessed three water portfolios
  - 2013-2014 drought year,
  - City-based, building on UWMP and pLAn goals
  - Maximize local water scenario
- 98 gpcd, projected population of 4.35 million people yields demand of 479.1 afy
- Eliminate imported water (125.6 afy) and Increase SW capture or water recycling by 33.2 afy and decrease consumption to 75 gpcd (365.6 afy)= self sufficiency!!

Supply Scenarios [acre feet/yr]	FY2013-2014	2035: city-based	2035: max local reuse
MWD	442K	100K	35K
LA Aqueduct	61K	139.4K	91K
Groundwater (net)*	79.4K	114.1K	114.1K
Recycled Water (irr & industrial use)	10.1K	45.4K	161.5K
Recycled Water (GWR)		43.1K	
Stormwater	included in groundwater	37K	58K
Total	592.3K	479.1K	459.6K

OCEAN PROTECTION COUNCIL

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